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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,209

11/03/2003

Christopher C. Jones

P17172

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28062

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11/15/2005

BUCKLEY, MASCHOFF, TALWALKAR LLC
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EXAMINER

SEMENENKO, YURIY

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/700,209

Applicant(s)

JONES, CHRISTOPHER C.

Examiner

Yuriy Semenenko

Art Unit

2841



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 9-15 and 20-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 16-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. 1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-8 and 16-19 drawn to an apparatus, classified in class 174 subclass 253.
- II. Claims 12-15 and 24-27 drawn to a system, classified in class 174 subclass 253.
- III. Claims 9-11 and 20-23 drawn to a method, classified in class 29 subclass 825.

1.2. The inventions are distinct, each from the other because of the following reasons:

Inventions groups II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process. For example, product could be made by method with fabricating conductor disposed between the microvia and microvia pad without electroless process.

1.3. Inventions group II and group I are related as combination and subcombination.

Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination (a system) as claimed does not require the particulars of the subcombination (a apparatus) as claimed because second microvia pad for the system can be any type pad and particularly without projection as claimed for a apparatus. The subcombination has separate utility such as for connection chip and layer of multi-layer board.

1.4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

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1.5. During a telephone conversation with Nandu Talwalkar (Registration No. 41339), on October 4, 2005, a provisional election with traverse was made to prosecute the invention of Group I, claims 1-8 and 16-19, drawn to a system. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-15 and 20-27 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

2. Claims 2-8 and 17-19 are objected to because of the following informalities: Claims 2-8 and 17-19 "An apparatus" should be changed to – the apparatus—for proper antecedence basis.
Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.1. Claims 1, 3-5, 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Geffken et al. (Patent # 6093630 hereinafter "Geffken").

3.1.1. Regarding claim 1: Geffken discloses in Fig. 7 an apparatus comprising: a first microvia pad 160; a second microvia pad 104, Fig. 4, having a projection 124 extending in a direction toward the first microvia pad; and a microvia electrically coupled to the first microvia pad and to the second microvia pad Fig. 7.

3.1.2. Regarding claim 3: Geffken discloses the apparatus according to claim 1, wherein the projection 120, Fig. 2 is an integral portion of the second microvia pad 104.

3.1.3. Regarding claims 4 and 7: Geffken discloses the apparatus according to claim 1 (6), further comprising: an [electroless] conductor 120, Fig. 2 disposed between the microvia and the second microvia pad 104, wherein the second microvia pad and the microvia are composed of an [electrolytic] conductor.

Geffken does not necessarily teach the Applicant's claimed "electroless" conductor. However, the examiner notes that a limitation "electroless" is a process limitation in the product claim. Such a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

3.1.4. Regarding claims 5 and 8 : Geffken discloses the apparatus according to claim 1(6), further comprising: an integrated circuit package including a plurality of metallization layers (column 5, lines 1-34), wherein a first one 160, 162 and 164 of the metallization layers (column 5, lines 1-7) includes the first microvia pad 160, Fig. 7, and a second one 104, 106, 108, Fig. 1 of the metallization layers includes the second microvia pad 104.

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3.2. Claims 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Zollo et al. (Patent # 2005/0016768 hereinafter "Zollo").

3.2.1. Regarding claim 16: Zollo discloses in Fig. 6A an apparatus comprising: an integrated circuit package core 66; and a microvia 35, Fig. 3C, having a first portion adjacent to a first microvia pad and a second portion adjacent to a second microvia pad, a width of the first portion being greater than a width of the second portion, wherein a distance between the first portion and the integrated circuit package core is less than a distance between the second portion and the integrated circuit package core.

3.2.2. Regarding claim 17: Zollo discloses in Fig. 6A the apparatus according to claim 16, further comprising: a second microvia 45, Fig. 4, having a third portion adjacent to a third microvia pad and a fourth portion adjacent to a fourth microvia pad, a width of the third portion being greater than a width of the fourth portion, wherein a distance between the third portion and the integrated circuit package core is less than a distance between the fourth portion and the integrated circuit package core.

3.2.3. Regarding claim 18: Zollo discloses in Fig. 6D the apparatus according to claim 17, wherein the first microvia is adjacent to a first side of the integrated circuit package core 66, and the second microvia is adjacent to a second side of the integrated circuit package core.

3.2.4. Regarding claim 19: Zollo discloses in Fig. 6D the apparatus according to claim 16, further comprising: a plurality of metallization layers 1-6, wherein a first one of the metallization layers includes the first microvia pad, and a second one of the metallization layers includes the second microvia pad.

3.3. Claims 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruber (Patent # 6294745 hereinafter "Gruber").

3.3.1. Regarding claim 16: Gruber discloses in Fig. 7 an apparatus comprising: an integrated circuit package core 10e; and a microvia 26 having a first portion adjacent to a first microvia pad and a second portion adjacent to a second microvia pad, a width of the first portion being greater than a width of the second portion, wherein a distance between the first portion and the integrated circuit package core is less than a distance between the second portion and the integrated circuit package core.

3.3.2. Regarding claim 17: Gruber discloses in Fig. 7 the apparatus according to claim 16, further comprising: a second microvia 26 having a third portion adjacent to a third microvia pad and a fourth portion adjacent to a fourth microvia pad, a width of the third portion being greater than a width of the fourth portion, wherein a distance between the third portion and the integrated circuit package core is less than a distance between the fourth portion and the integrated circuit package core.

3.3.3. Regarding claim 18: Gruber discloses in Fig. 7 the apparatus according to claim 17, wherein the first microvia 26 is adjacent to a first side of the integrated circuit package core 10e, and the second microvia 26 is adjacent to a second side of the integrated circuit package core.

3.3.4. Regarding claim 19: Gruber discloses in Fig. 2 the apparatus according to claim 16, further comprising: a plurality of metallization layers 34, wherein a first one of the metallization layers includes the first microvia pad 32, and a second one 12, Fig. 1A of the metallization layers includes the second microvia pad.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject

matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4.1. Claims 2 and 6 are rejected under 35U.S.C. 103(a) as being obvious over Geffken in view of Akram (Patent # 6093643 hereafter "Akram").

4.1.1. Regarding claim 2: Geffken discloses the apparatus having all of the claimed features as discussed above with respect claim 1,

except, Geffken doesn't explicitly teach the microvia includes a plurality of surfaces facing a plurality of surfaces of the projection.

Akram discloses in Fig. 5 the microvia includes a plurality of surfaces facing a plurality of surfaces of the projection 18, 20 and 22. At time the invention was made, it was well know to use the microvia includes a plurality of surfaces facing a plurality of surfaces of the projection.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Geffken to include in his invention the microvia includes a plurality of surfaces facing a plurality of surfaces of the projection.

Benefit of doing so is to made more robust structure.

4.1.2. Regarding claim 6: Geffken discloses in Fig. 7 a apparatus comprising: a first microvia pad 160; a second microvia pad 104, Fig. 4; and a microvia electrically coupled to the first microvia pad and to the second microvia pad , Fig. 7,

except, Geffken doesn't explicitly teach the microvia including a plurality of surfaces facing respective ones of a plurality of surfaces of the second microvia pad.

Akram discloses in Fig. 5 the microvia including a plurality of surfaces 18, 20 and 22 facing respective ones of a plurality of surfaces of the second microvia pad. At time the invention was made, it was well know to use the microvia including a plurality of surfaces facing respective ones of a plurality of surfaces of the second microvia pad.

Therefore it would have been obvious to one of ordinary skill in the art, at time the invention was made for Geffken to include in his invention the microvia including a plurality of surfaces facing respective ones of a plurality of surfaces of the second microvia pad.

Benefit of doing so is to made more robust structure.

5.1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuriy Semenenko whose telephone number is (571) 272-6106. The examiner can normally be reached on 8:30am - 5:00pm.

5.2. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571)- 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

5.3. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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